File Version: V1.0.0





Overview

This manual is to introduce the method to establish VPN tunnel between USR-G800(VPN Server) and USR-G806(VPN Client).

Note: After configuring G806 and G800, user needs to restart modules. And user can connect G800 VPN server interface(Only G806 one VPN Client connection, so only ppp0 in test) after configuring and restarting G806 and G800.

1.Configure USR-G800

1.1.Enter G800 Web Server

Connect PC to G800 LAN interface or WLAN interface and configure PC into DHCP mode as follow:

Jeneral	Alternate Configuration	n				
You car this cap for the	aget IP settings assigner ability. Otherwise, you r appropriate IP settings.	d automatica need to ask y	lly if y our r	your n networ	etwork k admir	supports iistrator
	otain an IP address auto	matically				
OU	e the following IP addre	ss:				
IP ac	idress:					
Sybr	iet mask:		1			
Defa	ult gateway:		\mathbf{r}_{i}	- 43	1	
() O	otain DNS server address	s automatica	ly			
OUs	e the following DNS serv	ver addresse	s:			
Prefe	erred DNS server:					
Alter	nate DNS server:		÷	10		
Πv	alįdate settings upon exi	it			Adv	anced

Figure 1 Configure PC to DHCP mode

Then enter G800 Web Server by entering G800 LAN interface IP address (Default is 192.168.1.1) and login with username and password(Default both are root). User can switch between English/Chinese from top right corner.

Communication Expert of Industrial IOT		Be Honest, Do Best!
	Authorization Required Please enter your username and password.	
	Username: root	
	Password: Login Reset	

Figure 2 Enter G800 Web Server



1.2.Upgrade firmware

User also needs to upgrade G800 firmware to **USR-G800-V1.0.15-vpnserver-1801221557.bin** which supports VPN Server function.

USR-G800	reset* . Download backup:
> Status	Reset to defaults: OPerform
> Services	To restore configuration files, you can upload a previously generated backup archive here.
> Network	Restore backup: 选择文件 未选择任何文件 🔟 Upload archive
> SerialtoEth	
> Firewall	
∽ System	Flash new firmware image
System	Upload a proper image here to replace the running firmware. Check "Keep settings" to retain the current configuration.
Administration	Keep settings:
Scheduled Tasks	
Backup/Upgrade Reboot	Image: 选择文件 未选择任何文件 II Flash image
> Logout	

Figure 3 Upgrade firmware

Note: User can't choose 'Check image' if user upgrades G800 from higher firmware to lower firmware.

The whole firmware upgrading process will last 30s~50s and user must keep powering the module and connecting to module during upgrading process. User needs to enter Web Serve again after upgrading successfully(Over 50s).

1.3.Enable VPN Server and configure parameters

Firstly, user should enable VPN Server and configure general parameters by Web Server as follow:

					C222	
				Server Settings	-G800	USR-G800
			d Cattions			
			ed Settings	Seneral Setup Advance	5	> Status
				Enable VPN Server	ces	✓ Services
			192.168.0.10	Server IP	te ip ddns	private ip ddns
		ess, it not required.	VPN Server IP address,		mic DNS	Dynamic DNS
			192.168.0.20-30	Client IP	ve Portals	Captive Portals
		ess, it not required.	VPN Client IP address, i	and 1111 (B. 1111	oteManager	RemoteManager
		G	8.8.8.8	DNS IP address	Server	PPTP Server
		the client, it not required.	This will be sent to the		Server	L 2TD Server
						Lzir Selvei
				Jsers Manager	OFK	Network
					ltoEth	> SerialtoEth
	IP address	Password	name	Enabled User	all	> Firewall
		· · · · · · · · · · · · · · · · · · ·			m	> System
a Delete	Automatically	test 🖉		e test	ut	> Logout
	IP address Automatically	Password	8.8.8.8 This will be sent to the of a s	DNS IP address Jsers Manager Enabled User	stemanager Server ork ItoEth all m	RemoteManager PPTP Server L2TP Server > Network > SerialtoEth > Firewall > System > Logout



After clicking 'Save & Apply' on bottom of web page, user also needs to configure VPN Server advanced parameters as follow:



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USR-G800	Server Settings		
> Status	General Setup Advance	ed Settings	
✓ Services	Enable MPPE Encryption	Allows 128-bit encrypted connection.	
private ip ddns	require mschap-v2	v	
Dynamic DNS	require mschap	×	
Captive Portals	require chap		
PPTP Server	require eap		
L2TP Server	require pap		
Network	Enable NAT Forward	Allows forwarding traffic.	
SerialtoEth	Enable remote service	Allows remote computers on the Internet to c	connect to VPN Server.
Firewall	LCD actor follows threshold	3	
ystem	LCP echo fallure ulreshold	Presume peer to be dead after given amount of L	LCP echo failures, use 0 to ig
Logout	LCP echo interval	120	

Figure 5 VPN Server advanced parameters

1.4.Add VPN Server interface

User can add VPN Server interface as follow:

	<u>~</u>	Interfaces						
USR-G800		Interface Overview						
Status		Network	Status	Actions				
Services Network Interfaces		LAN 8 ³ (登 条) br-lan	Uptime: 0h 13m 33s MAC-Address: D8:80:4C:D0:18:ED RX: 236.23 KB (1894 Pkts.) TX: 637.07 KB (1744 Pkts.) IPv4: 192.168.1.1/24 IPv6: FD5F:9A71:EA59:0:0:0:0:1/60	<pre> Connect Stop Connect C</pre>				
APNSET IPSECSET Wifi		WAN_4G	Uptime: Oh Om Os MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 92.68 KB (273 Pkts.)	<pre># Connect Stop</pre> <pre> Edit Delete </pre>				
DHCP and DNS Hostnames Static Routes		WAN_WIRED	Uptime: 0h 13m 29s MAC-Address: D8:80:4C:D0:18:ED RX: 806.20 KB (6421 Pkts.) TX: 144.06 KB (1096 Pkts.) IPv4: 192.168.5.63/24	 Connect Stop Edit Delete 				
Diagnostics QoS > SerialtoEth		Add new interface						



Then configure VPN interface as follow:

- Name of the new interface: User can configure the 'Name of the new interface' according to own wants which must conform to rules.
- Protocol of the new interface: Choose 'Unmanaged'.
- Cover the following interface: When user adds new VPN Server interface and configures 'Custom Interface', user should add one new interface from ppp0 once there is new VPN Client connection.(In this manual, only one G806 connects to G800 as VPN Client, so configure 'Custom Interface' to 'ppp0'. If there are two VPN Client connections, G800 should have two new interface with "ppp0' and 'ppp1'.)



Figure 7 Configure VPN Server interface

USR-G800 Interfaces Interface Overviev Network Status Actions V Network Uptime: 0h 12m 5s SERVER1 🖉 Connect 🛛 🙆 Stop RX: 8.04 KB (107 Pkts.) -Interfaces TX: 1.73 KB (30 Pkts.) n Delete C Edit ppp0 IPv4: 192.168.0.10/32 APNSET Uptime: 0h 13m 40s IPSECSET MAC-Address: D8:B0:4C:D0:18:ED LAN 🖉 Connect 🛛 🙆 Stop RX: 476.20 KB (3497 Pkts.) Wifi 3º (*****) TX: 1.03 MB (3111 Pkts.) 🗹 Edit 🛛 🧴 Delete br-lan IPv4: 192.168.1.1/24 DHCP and DNS IPv6: FD5F:9A71:EA59:0:0:0:0:1/60 Hostnames Uptime: 0h 0m 0s WAN 4G 🖉 Connect 🛛 🙆 Stop MAC-Address: 00:A0:C6:00:00:00 Static Routes eth1 RX: 0.00 B (0 Pkts.) 🗹 Edit 🛛 📋 Delete TX: 93.36 KB (275 Pkts.) Diagnostics Uptime: Oh 13m 36s WAN_WIRED 005 MAC-Address: D8:B0:4C:D0:18:ED Stop 2 Connect RX: 776.97 KB (5335 Pkts.) SerialtoEth eth0.2 🗹 Edit 🛛 💼 Delete TX: 281.81 KB (1931 Pkts.) 102169562/2/

Figure 8 VPN Server interface

1.5.Configure Static Routes

To achieve communication between two router's device through VPN tunnel, user should configure 'Static Routes'.

Configure the Static routes as follows:

• Interface: Choose VPN interface.(server1 in this test)

After VPN Client connecting, the ppp0 interface will display as follow:

- Target: 192.168.10.0. IP of VPN Client's(G806) device. G806's LAN IP is changed to 192.168.10.1 in next steps, so Target set to 192.168.10.0 can communicate to all device which connect to G806 LAN interface.
- IPv4-Netmask: 255.255.255.0.
- IPv4-Gateway: 192.168.0.10(VPN Server IP which same as G800 PPTP Server parameters)



Be Honest, Do Best !	G800(VPN Server)+G806	(VPN Client) realize	VPN networking	g Technical	Support: h.	usriot.com
USR-G800	Routes Routes specify over which	interface and gateway a certain h	ost or network can be n	eached.		
> Status > Services	Static IPv4 Routes					
✓ Network	Interface Tar	get IPv4-Netmask	IPv4-Gateway	Metric	MTU	
Interfaces APNSET	Host-IP or	r Network if target is a network		_		
IPSECSET	server1 v 192.168.	.10.0 255.255.255.0	192.168.0.10	0	1500	🛅 Delete
Wifi DHCP and DNS	🔁 Add					
Hostnames	Static IPv6 Routes					
Static Routes	Interface	Target		IPv6-Gateway	Metric	MTU
QoS		IPv6-Address or Network	(CIDR)			
> SerialtoEth		This s	ection contains no value	es yet		

Figure 9 Static Routes configuration

1.6.Configure Firewall

USR-G800	Input	accept 🔻				
	Output	accept 🔻				
Status	Forward	accept 🔻				
Services						
Network						
SerialtoEth	Zones					
✓ Firewall	Zone ⇒ Forv	wardings Input	Output Forward	Masquerading	MSS clamping	
General Settings						
Port Forwards						ď
Traffic Rules	lan: 📰 👷	<pre>wan accept ▼</pre>	accept 🔻 accept 🔻			<u></u>
Custom Rules						
Restricting access	wan: wan wired: 🐨 war		accent V			ď
rate-limiting	Wall, Wall_Wied, 2, Wal	accept +	accept		V	💼 D
System						
Logout	🔁 Add					

Figure 10 Configure Firewall



2.Configure USR-G806

2.1.Enter G806 Web Server

Connect PC to G806 LAN interface or WLAN interface and configure PC into DHCP mode as follow:

General	Alternate Configuration					
You car this cap for the	n get IP settings assigned bability. Otherwise, you na appropriate IP settings.	automatic eed to ask	ally if your r	your n networ	etwork su k administ	pports rator
\odot	btain an IP address autom	atically				
OU	e the following IP address	s:				
ĮP a	ddress:					
Sybr	net mask:			- 10		
Defa	ult gateway:		12	12		
	<u>b</u> tain DNS server address	automatica	ally			
OU	s <u>e</u> the following DNS serve	er addresse	es:			
Pref	erred DNS server:		1.	1.53		
Alter	mate DNS server:		1	162		
V	alidate settings upon exit				Advan	ced

Figure 11 Configure PC to DHCP mode

Then enter G806 Web Server by entering G806 LAN interface IP address (Default is 192.168.1.1) and login with username and password(Default both are root). User can switch between English/Chinese from top right corner.

USR-G806	
Communication Expert of Industrial IOT	Be Honest, Do Best!
	Authorization Required Please enter your username and password.
	Username: root Password: Login Reset
	JiNan Usr 10T Technology Limited http://www.usr.cn/

Figure 12 Enter G806 Web Server



2.2.Modify G806 LAN interface IP

After entering G806 Web Server, because G806's default LAN interface IP is same as G800's default LAN interface, we change G806's LAN interface IP address to 192.168.10.1 as follows:



Figure 13 Modify G806 LAN interface IP

After modifying to 192.168.10.1, user should click 'Save&Apply' on bottom of web page to make settings take effect. And user also needs to enter Web Server by 192.168.10.1 again.

2.3.Add VPN Client interface

Firstly, add new interface with protocol PPtP as follows:



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206	Î	Interface Overview		
N-9000		Network	Status	Actions
Status		LAN	Uptime: 0h 4m 58s MAC-Address: D8:B0:4C:B9:A0:6D	Connect Stop
ervices letwork		ø g (∰∑ ⊛) br-lan	RX: 432.55 KB (4734 Pkts.) TX: 14.80 MB (11759 Pkts.) IPv4: 192.168.10.1/24 IPv6: FDCD:EB8D:30B4:0:0:0:0:1/60	Edit Delete
erfaces M Card SEC	Е	WAN_4G	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 6.80 KB (22 Pkts.)	Connect Stop Edit Delete
i		WAN_WIRED	Uptime: 0h 42m 57s	Connect Ston
Client CP and DNS		eth0.2	RX: 14.84 MB (22928 Pkts.) TX: 542.93 KB (4185 Pkts.) IPv4: 192.168.5.53/24	Edit Delete
names		WWAN	Uptime: 0h 0m 0s	Connect Stop
tic Routes		🥩 🎑 br-wwan	RX: 0.00 B (0 Pkts.) TX: 294.19 KB (863 Pkts.)	Edit Delete
ostics		a dal manu inanaf		
		Add new interface		



Figure 14 Add new VPN Client interface

After configuration, user should click 'Submit" on bottom of web page to continue configuring.

Then configure VPN Client interface as follows:

- VPN Server: 192.168.5.63(We take LAN test as a example, so we write G800's WAN interface IP address from superior router here. In actual use, user should use public network IP address or domain name)
- PAP/CHAP username: test(Same as G800 VPN settings)
- PAP/CHAP password: test (Same as G800 VPN settings)



	names of several network inter	Taces separated by spaces. Y	ou can also use VLAN nota	ation INTERFACE.VLANNR (e.g.: eth0.1).
Status	Common Configuration			
Services	General Setup Advanced	Settings Firewall Settin	ngs	
Network	Status		RX : 0.00 B (0 Pkt;	s.)
Firewall		pptp-test	TX: 0.00 B (0 Pkts	s.)
WAN/LAN Port				
System	Protocol	PPtP		
Logout	VPN Server	192.168.5.63		
	PAP/CHAP username	test		
	PAP/CHAP password	••••	a B	

Figure 15 Configure VPN Client interface

User can know G800's WAN interface IP as follow(We connect G800 to superior router by wired WAN interface not insert SIM card to connect internet in the test):

USR IOT IOT Experts				Be Honest,	, Do Best! AUTO REFRESHON ≑ ☆ English
≏ USR-G800	Interfaces				
> Status	Interface Overview				
> Services	Network	Status	Actions		
Vetwork Interfaces APNSET	LAN 参 (空言意) br-lan	Uptime: 0h 2m 53s MAC-Address: D8:80-404C:D0:18:ED RV: 153:76 K8 (1251 Pits.) TV: 445:49 K8 (1133 Pits.) IPv4: 129:168.1.1/24 IPv6: FD5:F9A71:EA59:0:0:0:1/60	ConnectStopEditDelete		
Wifi DHCP and DNS	WAN_4G	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 19.83 KB (60 Pkts.)	 Connect Stop Edit Delete 		
Hostnames Static Routes Diagnostics	WAN_WIRED	Uptime: 0h 2m 49s MAC-Address: D8:80:4C:D0:18:ED RX: 399.19 KB (1878 Pkts.) TX: 107.33 KB (766 Pkts.) IPv4: 192.168.5.63/24	🖉 Connect 🛛 🕲 Stop 🗭 Edit 📋 Delete		
QoS	Add new interface.	•			
> SerialtoEth					

Figure 16 G800 WAN interface IP

2.4.Configure Static Routes

To achieve communication between two router's device by VPN tunnel, user should configure 'Static Routes'.

Configure the Static routes as follows:

- Interface: Choose VPN interface.(test in this test)
- Target: 192.168.1.0. IP of VPN Server's (G800) device. G800's LAN IP is 192.168.1.1, so Target set to 192.168.1.0 can communicate to all device which connect to G800 LAN interface.
- IPv4-Netmask: 255.255.255.0.
- IPv4-Gateway: 192.168.0.20(VPN Client IP which same as G800 PPTP Server parameters)



Be Honest, Do Best !	G800(VPN Server)+G806(V	PN Client) realize VPN r	networking Technic	al Support: h.usriot.com					
USR-G806	Routes Routes specify over which in	terface and gateway a certain host or ne	stwork can be reached.						
> Services	Static IPv4 Routes								
Interfaces	Interface Targe	t IPv4-Netmask IPv	v4-Gateway Metric	МТU					
SIM Card	Host-IP or Network if target is a network								
IPSEC E	test • 192.168.1.	0 255.255.255.0 192	.168.0.20	Delete					
Wifi									
AP Client	Add								
DHCP and DNS									
Hostnames	Static IPV6 Routes								
Static Routes	Interface	Target	IPv6-Gateway	Metric MTU					
Diagnostics	IPv6-Address or Network (CIDR)								
QoS		T							
> Firewall	This section contains no values yet								

Figure 17 Configure Static Routes

USR-G806	Input accept Output accept	
> Status	Forward accept	
> Services		
> Network	Zones	
∽ Firewall		
General Settings	Zone ⇒ Forwardings Input Output Forward Masqueradin	MSS clamping
Port Forwards		
Traffic Rules		Edit
Custom Rules	Ian: 200 (200) ⇒ wan accept accept accept □	Delete
Access Restrictions		
Rate Limiting		Edit
> WAN/LAN Port	wan: war_wireu: ﷺ war_49: ﷺ wwan: ﷺ → REECT accept accept accept	Delete
> System		
> Logout	Add	

Figure 18 Configure Firewall

2.5.Configure Firewall



3.Test

After above all configuration, user can connect G806 and G800 to a same superior router and ping successfully between G800's device and G806's device as follow:



Figure 19 Ping successfully



4.Contact Us

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5.Disclaimer

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6.Update History

2018-02-09 V1.0.0 established.